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*CH-47 Spotlight:* A look  
at current and future issues

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# CH-47: A look at current issues

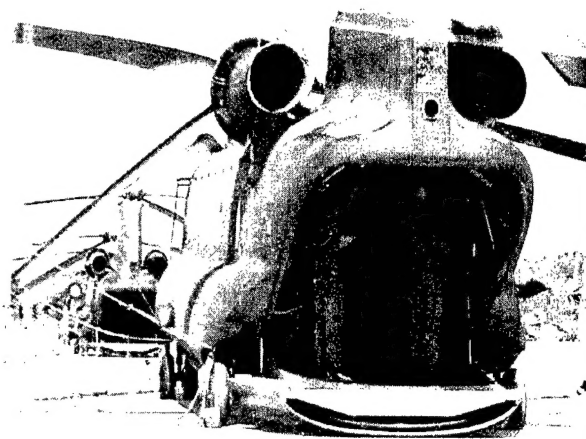
## CONTROL STIFFNESS BINDING DURING FLIGHT-CONTROL CHECK

The CH-47 fleet at Fort Rucker was administratively grounded for 3 weeks this past year due to control stiffness/binding that was experienced during maintenance test flight checks prior to engine start. The test pilot was conducting the flight controls check, in accordance with the maintenance test flight manual, when the stiffness and binding was encountered. The flight controls checks were repeated on different aircraft, and the stiffness/binding could be replicated on those aircraft. After an exhaustive investigation by the Safety Center, Boeing, and the Program Manager's office, it was determined that the stiffness/binding was a design characteristic of the actuator and that the aircraft were safe to fly. The Fort Rucker fleet was returned to service, and revisions to the maintenance manuals are being developed.

**Uncommanded flight-control inputs:** This is an ongoing issue within the community that has yet to be resolved. Investigations have been conducted, but none have turned up conclusive evidence of the cause of any of the reported incidents. ASAM CH-47-97-ASAM-01 (151327Z Oct 97) and

CH-47-99-ASAM-02 (161228Z Feb 99) have been issued to address suspected causes, and to ensure the proper operation of the aircraft systems. Units should comply with the published messages, and conduct all maintenance procedures by the book. If any flight control anomalies are experienced they should be documented thoroughly and reported through unit safety and maintenance channels.

**Hydraulic System purification:** Historically the CH-47 flight control systems have never been serviced or the filters changed unless there was a maintenance problem requiring action. The fact that the systems were never serviced was highlighted during the investigations that tried to determine the cause of the uncommanded flight-control inputs reported from the field. CH-47-99-ASAM-02 (161228Z Feb 99) requires the purification of all aircraft flight and utility systems, and CH-47-00-ASAM-03 (012043Z Jun 00) details the sampling and reporting procedures. This purification and reporting is designed to: remove contaminants (water, particulates, air, solvents), improve system performance, extend fluid life, and establish a baseline for future investigations.



## In-flight operations with the cargo-loading ramp down:

The CH-47 cargo loading ramp is an integral part of the fuselage structure, and consequently should be in the full up position during flight. Mission profiles requiring the ramp to be in other than the full up position during flight are acceptable, but those times are the exception rather than the rule. When the ramp is down, it should be for the accomplishment of a specific task or mission, and then the ramp should be returned to full up position upon completion of the task. Possible mission profiles include but are not limited to: paradrops, SOF insertion/extraction techniques, internal load operations, emergencies, and safety considerations. Maintaining the ramp in the full up position during flight will improve the structural integrity of the aircraft and reduce the possibility of ramp/fuselage damage during an emergency landing sequence. ♦

—CW5 Noel C. Seale, Chief, Cargo Branch,  
Directorate of Evaluation and Testing. DSN  
558-3475, (334) 255-3475

## A look at the numbers

FY 99 was a good year for the Chinook community. Even though we had one Class A accident, we had no fatalities for the third year in a row. The CH-47 fleet had one Class B, ten Class C, six Class D, and 177 Class E mishaps. Damage cost totaled \$4,303,134.

**TABLE 1. CH-47 ACCIDENT INCIDENT EXPERIENCE**

<b>FY</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>Fatalities</b>	<b>Total Cost</b>
<b>95</b>	<b>2</b>	<b>0</b>	<b>7</b>	<b>8</b>	<b>218</b>	<b>6</b>	<b>18,968,929</b>
<b>96</b>	<b>2</b>	<b>0</b>	<b>15</b>	<b>9</b>	<b>192</b>	<b>5</b>	<b>36,149,831</b>
<b>97</b>	<b>1</b>	<b>3</b>	<b>11</b>	<b>3</b>	<b>181</b>	<b>0</b>	<b>13,936,699</b>
<b>98</b>	<b>0</b>	<b>2</b>	<b>17</b>	<b>3</b>	<b>121</b>	<b>0</b>	<b>1,790,405</b>
<b>99</b>	<b>1</b>	<b>1</b>	<b>10</b>	<b>6</b>	<b>177</b>	<b>0</b>	<b>4,303,134</b>
<b>Total</b>	<b>6</b>	<b>6</b>	<b>60</b>	<b>29</b>	<b>889</b>	<b>11</b>	<b>75,148,998</b>

## Chinook publications update

TC 1-210 (TC 1-200) .....	Commanders Guide .....	Currently under revision
TC 1-216 (TC 1-240) .....	Aircrew Training Manual .....	Currently under revision
TM 55-1520-240-10 .....	Operators manual .....	Current with change 14
TM 55-1520-240-CL .....	Operator/Crewmember Checklist .....	Current with change 11
TM 55-1520-240-PMD .....	Preventative Maintenance Daily .....	Current with change 14
TM 55-1520-240-MTF .....	Maintenance Test flight manual .....	Current with change 25
TM 55-1520-240-PM .....	Phased Maintenance Checklist .....	Current with change 17
TM 55-1520-240-23-1 .....	Maintenance manual .....	Current with change 71
TM 55-1520-240-23-2 .....	Maintenance manual .....	Current with change 26
TM 55-1520-240-23-3 .....	Maintenance manual .....	Current with change 19
TM 55-1520-240-23-4 .....	Maintenance manual .....	Current with change 40
TM 55-1520-240-23-5 .....	Maintenance manual .....	Current with change 33
TM 55-1520-240-23-6 .....	Maintenance manual .....	Current with change 25
TM 55-1520-240-23-7 .....	Maintenance manual .....	Current with change 22
TM 55-1520-240-23-8 .....	Maintenance manual .....	Current with change 17
TM 55-1520-240-23-9 .....	Maintenance manual .....	Current with change 25
TM 55-1520-240-23-10 .....	Maintenance manual .....	Current with change 21
TM 55-1520-240-23P-1 .....	Parts manual .....	Current with change 14
TM 55-1520-240-23P-2 .....	Parts manual .....	Current with change 16
TM 55-1520-240-23P-3 .....	Parts manual .....	Current with change 12
TM 55-1520-240-23P-4 .....	Parts manual .....	Current with change 06

# DES observations

## GENERAL

**D**uring recent DES unit assessments most units performed well overall, but training and administrative weaknesses were noted as detailed below. OPTEMPO and PERSTEMPO were up across the board, but the units were motivated and generally the commands were supportive of the crewmembers and the rigors of the mission load.

## AIRCREW COORDINATION TRAINING (ACT)

**T**C 1-210 requires all crewmembers to have ACT completed prior to progression to RL 1, and for the training to be documented on the DA Form 759 and the DA Form 7122. If the training was documented prior to the initiation of the new ATP forms, a red informational entry can be made on the DA Form 7122 indicating the training with no entries for flight time and no remarks. IERW Class 95-07 and subsequent ones are ACT qualified during IERW training and should have the entry "ACT qualified" on their DA Form 759. If the training was completed after the initiation of the new ATP forms then all entries per the TC 1-210 are required. Crewmembers that conducted the training should have documentation on the DA Form 759 or DA Form 7122 indicating that they are ACT trainers. Units also need to develop and implement a written ACT sustainment-training program through the ATP.

## EVALUATION VERSUS TRAINING

If the mission is an evaluation and it was incomplete, unsatisfactory, or satisfactory then it should be documented as such. Some missions start out as evaluations, but if the crewmembers performance is not up to standard then the mission becomes training. This practice degrades the standardization program in the unit, and reinforces the lack of everyday preparedness of the crewmembers. If additional training is required, then propose a training strategy, complete a DA Form 4507 to

document the training and administer a re-evaluation after the training is completed.

## EVALUATOR DOCUMENTATION

TC 1-210 requires the documentation of all evaluations on the DA Form 7122, but allows the recorder to be someone other than the evaluator. Units are recording evaluations but the person making the entry does not have the qualifications to conduct the evaluation and there are no remarks listing the evaluator. DES recommends that if the person making the entry was not the evaluator then a remark should be made indicating the evaluator's last name, first initial, rank, and qualifications.

## RATED CREWMEMBERS (RCM)

**Instruments:** Aviators are not confident/proficient in instrument flying, and inadvertent IMC training is not a hands-on event. Most units are so mission-focused that instrument training is not a priority, and as a result of this focus, aviators are losing their proficiency in instrument tasks. Flying instruments in the national airspace system is the only way to gain and maintain true instrument proficiency—simulator training is beneficial but it is no substitute. Instrument flying should be included in the no-notice program.

**Equipment:** Based on the mission, aviators are not utilizing all of the systems on board the aircraft for every flight. For missions in the local area, the Aircraft Survivability Equipment (ASE) is rarely used, and at times the navigation equipment is not powered up. Aircrews should power up and check all aircraft equipment during the run-up, and then disable or turn off the equipment that is not needed. Although the equipment is not needed for the accomplishment of the mission, its routine use will ensure proper system operation and improve operator proficiency.

**SFTS Instrument Evaluations;** AR 95-1 requires the annual Instrument Flight Evaluation to be conducted in the aircraft. With the commander's approval, and if certain conditions exist, the evaluation may be conducted in a compatible simulator. DA Form 7122 entries indicate that instrument evaluations are being conducted in the



simulator, but there is no record of the commander's approval. DES recommends a remark on the DA Form 7122 stating the commander's approval to conduct the evaluation in the simulator.

**Heads Up Display (HUD):** The majority of units visited have the aircraft modified for HUD, and they also have the Display Units (DU) available. The aviators that fly with the system are in the minority, and for the most part no more than 4 qualified pilots have been verified in any unit. Unless a training program is developed and implemented, the current trainers will PCS leaving a unit with equipment and no way to qualify aviators in its use. Units should develop an SOP and training program for implementation during NVG RL 2 training. Once aircrews become comfortable with the system, its operation and use will become routine.

**Simulator training:** Units are utilizing the simulator, but not utilizing the device to its full potential. The simulator training should be designed to complement the ATP, and not just be seen as a requirement. Console operators should instill the mentality that flying the simulator is just like flying the aircraft from mission briefing to mission de-brief. Aviators should understand that the simulator is where they internalize proper reactions to emergencies,

and where they learn to react to threats using aircraft survivability equipment and terrain flight techniques. The simulator is where the trainers can observe crew coordination of unit aircrews.

### **NON-RATED CREWMEMBERS (NCM)**

**Academic training:** Units are not scheduling or conducting aviation specific NCM academic training. CTT is regularly scheduled, but generally there is no emphasis on the improvement and sustainment of aviation skills and knowledge. NCMs should be scheduled for aviation-specific classes on a weekly basis, and the training should be attended by the NCO chain of command. If the RCMs are receiving academic training required by the NCMs, then the NCMs should be included in that training. When the RCM training is not applicable to the NCM, then training should be scheduled concentrating on NCM task.

**Fundamentals of Instruction (FOI):** Flight Engineers (FE) conduct most of the training in Chinook units and receive no training in the fundamentals of instruction. Flight Instructors (FI) and Standardization Instructors (SI) received initial training but no sustainment FOI training. The NCM academic schedule should include training on FOI conducted by a unit Instructor Pilot for unit FEs, FIs, and SIs. ♦

## **The future of the Chinook**

### **EXTENDED RANGE FUEL SYSTEM II (ERFS II)**

**T**he ERFS II upgrade uses the Guardian fuel system manufactured by Robertson. The tanks are crashworthy, self-sealing, ballistically tolerant and provide a 25-inch aisle for ease of movement. Each tank has a capacity of 800 gallons and the aircraft can be equipped with up to 3 tanks and Forward Area Refueling Equipment (FARE). An improved fuel control panel allows single point pressure refueling of the tanks simultaneously with the aircraft main tanks, and provides a quantity gauge that can monitor each tank individually or all tanks.

The system provides the capability of



dispensing 2,400 gallons of fuel within a 150 NM radius of action or a self-deployment range of 1,100 NM. Fielding of the system is currently underway.

**T55-GA-714A:** The 714A engine upgrade program is designed to buy-back the performance lost due to aircraft weight growth. The engine produces 21% more hot-day shaft horsepower, has specific fuel consumption reduced by 5%, and has improved engine corrosion protection. The engine incorporates a Full Authority Digital Electronic Control (FADEC) that automatically prevents the engine from exceeding any of its operating limits. Reliability

improvements include improved: torque meter, compressor, combustor, starter drive bearing, oil pump, and oil filter. Fielding is currently underway and scheduled to be completed in FY 07.

### **CH-47F**

The CH-47F is a service life extension program designed to enable the CH-47 aircraft to bridge the gap to the Joint Transport Rotorcraft (JTR). The service life extension is achieved by a complete airframe rebuild, which restores the airframe as near as possible to its original life expectancy.

This airframe rebuild also includes improved vibration reduction technology, improved

corrosion protection, and a low maintenance rotor head. These improvements will lead to reduced operating and support cost as well as increased fleet readiness. Enhances to air transportability reduced the man hours/total hours required for disassembly/reassembly from the 115.6 MH/15.15HR on the CH-47D to 47.8MH/5.2HR on the CH-47F. Additional improvements include: Extended Range Fuel system II (ERFS II), T55-GA-714A engine, and a digital cockpit that makes the aircraft force XXI compatible. The first delivery is scheduled for May 2003. ♦

—CW5 Noel Seale, Chief, Cargo Branch, DES



## **Paving a path to the future**

**W**ith the recent release of the new Army Aviation Modernization Plan, we, the material developers, have a clear understanding of our customers' future needs. This plan is consistent with the vision provided by our Program Executive Officer, Aviation, Major General James R. Snider, directing our design and sustainment efforts on the four aviation platforms—Comanche, Apache, Black Hawk, and Chinook—while laying the ground work for the eventual development and fielding of the Future Transport Rotorcraft (FTR).

Within the Cargo Helicopters Project Office we have created a product-oriented organization, as opposed to the traditional functional organizations. We seek to sustain the current fleet, extend the service life of the aging aircraft, and apply needed upgrades to ensure maintainability and battlefield compatibility.

### **MODERNIZATION PROGRAMS**

The office is evolving a philosophy of managing cargo helicopters as a "system-level" team, re-engineering the way we accomplish life-cycle management.

The first step in this process is to establish an

aircraft system baseline for the fielded fleet that captures and defines what the true costs and cost drivers are to operate the CH-47 worldwide. Once the baseline is established, we must have a data-management system that will feed our newly formed customer service and fleet-management cells, enabling us to provide soldiers all the needed logistical elements based on the ever-changing operational tempo (OPTEMPO).

As we continue our efforts to baseline and manage the fleet, we have also embarked on a path to upgrade the fielded fleet through minor modification programs, culminating in the CH-47F Improved Cargo Helicopter Service Life Extension Program (SLEP). One of our larger modification efforts is the procurement of the T55-GA-714A engine, which affords a 27 percent increase in power, with a reduced specific fuel consumption of 5 percent. This much needed upgrade will be applied to all CH-47s and will begin fielding this year.

In addition, the development and procurement of the Extended Range Fuel System (ERFS) finally gives our soldiers a crashworthy internal fuel system that either extends their range or enables them to conduct FAT COW (refueling) operations for other aircraft or forward-deployed ground systems.

Beginning this year, all CH-47s will be modified to accept ERFS, with two complete systems fielded per platoon.

And in our continuing effort to reduce the operations and support costs of the aircraft, the Low Maintenance Rotor Head program seeks to replace the oil-lubricated hubs with an improved hub using "dry-film" bearings. This effort is a combined initiative with our partners from the United Kingdom. The program kicked off last year, and is well on the way to a 60 percent reduction in parts and a six-fold decrease in material costs.

## **BRIDGING THE GAP**

The CH-47 Improved Cargo Helicopter is the aircraft that will bridge the gap to the Future Transport Rotorcraft (FTR). Three hundred CH-47Ds were earmarked for the upgrade to extend their service lives until the FTR is

available. The Army recognized that to extend the Chinook's service life an additional 20 years would require a detailed re-manufacturing program, additional improvements to reduce operations and support costs, and a digital cockpit upgrade to ensure compatibility with the Army's digitization initiatives. The program was formulated based on the success of the CH-47D upgrade, the planned application of demonstrated new technologies, and incorporation and improvement of existing cockpit modifications from our special operations aircraft.

The remanufacturing effort is designed to restore the CH-47 airframe as near as possible to the original life expectancy of 20 years. There is a significant difference between an overhaul that returns an aircraft to service and a re-manufacture program that actually extends the aircraft's service life. Having the airframe re-manufactured is a prime opportunity to apply cost-effective improvements to enhance performance or reduce the maintenance burden.

## **ATTACKING PROBLEMS**

Corrosion continues to be a problem in the floors of our Chinooks. The Army-Boeing team has selected a new bilge paint that is flexible enough to accommodate the flexing of the airframe. Additionally, while reviewing the design, the team sought to reduce the time it takes to dismantle the aircraft for shipment aboard Air Force aircraft. To make a long story short, the team developed a kit—which will be applied to all CH-47Fs—that will enjoy a 58 percent man-hour reduction and a 65 percent time reduction to disassemble and assemble the aircraft. This kit was applied to Bearcat 3, our test aircraft at the Aviation Technical Test Center (ATTC), and these times were demonstrated.

One of the key cost-reduction initiatives on the CH-47F is to improve subsystem reliability and reduce airframe cracking through airframe tuning. Airframe tuning involves changing the natural frequencies of the airframe, reducing vibration and reducing responses to rotor forces. To demonstrate the potential benefit, the Army and Boeing entered into a cooperative

research-and-development agreement, applying the modification to Bearcat 3. The aircraft demonstrated significant vibration reduction throughout, approaching an 80 percent reduction in one area.

### **COCKPIT DIGITIZATION**

The Chinook cockpit-digitization effort is designed to provide the crew with improved situational awareness and enhance their survivability. The newly designed cockpit will incorporate a 1553 data bus with a modular, open architecture that ensures growth potential. The cockpit incorporates the Harris digital map into the Rockwell-Collins electronic flight instrument system coupled with smart multi function displays. Since we are using existing equipment in the cockpit, the challenge here is software. There are software integration labs operating at both Rockwell and Boeing. Software drops one and two were delivered by Rockwell-Collins on time. Thus far, no major software trouble reports have been generated.

Cockpit development is on schedule.

### **THE WORKHORSE OF THE ARMY**

As you can see, the future of cargo helicopters is bright. We have a team that is focused on providing a combat multiplier that is interoperable, versatile, deployable, survivable and sustainable.

From Vietnam to Kosovo, the CH-47 has been the Army's workhorse. It brings to every Army contingency a unique capability that is inherently flexible to meet the soldier's requirements.

However, if the system is not sustainable, it becomes a burden. We believe that our initiatives and programs to assist our soldiers with the maintenance, sustainment and upgrade of this aircraft will ensure that this true battlefield enabler will be there to ensure full spectrum dominance. ♦

—James Caudle, Project Manager, Cargo Helicopters, Aviation and Missile Command, Redstone Arsenal, AL 35898, DSN 897-3397 (256) 313-3397, [james.caudle@peoavn.redstone.army.mil](mailto:james.caudle@peoavn.redstone.army.mil)

(Adapted courtesy of Army Aviation Magazine)

## **Website resources for Cargo aircraft**

### **Department of Evaluation and Standardization (DES)**

<http://www-rucker.army.mil/des/des/htm>

### **DES Official Cargo website**

<http://www-rucker.army.mil/des/cargo.htm>

### **Cargo helicopter project management office**

<http://www.Chinook.redstone.army.mil>

### **AMCOM Aviation safety messages**

<http://www.redstone.army.mil/sof>

### **US Army Night Vision Goggle (NVG) Branch**

<http://www-rucker.army.mil/atb/nvd/nvdb.htm>

### **US Army Safety Center**

<http://safety.army.mil/home.htm>

### **Electronic technical manuals online**

<http://www.logsa.army.mil/etms/online.htm>

### **Military Aircrew Information Service (MAIS)**

[www.mail.afwa.af.mil](http://www.mail.afwa.af.mil)

### **Aerial delivery and field services (sling information)**

[www.quartermaster.army.mil/adfsd/index/html](http://www.quartermaster.army.mil/adfsd/index/html)

### **CH-47 user home page**

<http://www-rucker.army.mil/DCD/ICH4/default.htm>



# Corpus Christi Army Depot

## Bearings Shop keeps helicopter fleets flying

**"I**f we had not been here, the Chinooks and Apaches would not be flying today," said CCAD Bearing Shop supervisor, Manuel Torres, during a tour of his unique facility. He was talking about the grounding of both the CH-47 Chinook and AH-64 Apache Attack Helicopter fleets in the past year due to flawed transmissions.

Part of that work was the replacement, inspection, and repair of the CH-47 first & second stage planetary gear bearing assemblies, and the AH-64 transmission bearings, sprag-clutches, and hanger bearings.

Hundreds of forward and aft transmissions from the big twin engine Chinook, and hundreds more transmissions and hanger bearing assemblies from the Apaches, have had to be checked and, when necessary, fixed at the Army Depot, since Fall 99.

The Bearing Section processed and restored to serviceable status over 3,300 first and second stage planetary gear bearing assemblies for the CH-47 Safety of Flight (SOF) program. This was quite an accomplishment as the shop normally processes only 100 each of the first and second stage planetary gear bearing assemblies on an annual basis. The bulk of these gear bearing assemblies were turned around within one work shift. "My folks did a terrific job; but we also had super support from Tom Long's and Frank

Munoz's Non Destructive Testing (NDT) shops. They performed the 200 percent NDT inspection requirement on the gears," Torres said. The section also processed over 700 sprag-clutches and reclaimed over 2,500 critical transmission and hanger bearings for the AH-64 SOF programs during this same period.

The Bearing Section is the only facility of its kind in the US Army. It is also only one of three within the Department of Defense that are authorized to perform complete overhaul and repair on aviation bearings. The Navy facility is located in North Island, San Diego and the Air Force facility is at Tinker AFB. In fact, "Tinker used the Corpus Christi Army Depot shop to benchmark theirs," said Torres, "so it is almost exactly like ours," he said.

The section currently processes over 4,000 different vendor part numbered bearings, gear assemblies, and sprag-clutches ranging from 28 inches to a quarter-inch in diameter that are vital in helicopter systems—engines, transmissions, and other systems. For example, an Apache transmission has 48 bearings, four sprag clutches and six planetary gear bearing assemblies. The Chinook's aft and forward transmissions have 41 bearings and 20 planetary gears. Bearings are tough; some have 30,000 hours. Torres has seen some of the bearings he worked on years ago come

through again and again. "You get so you can recognize your own work," he said. "It's like a signature. It has to be good, because a record is kept for 15 years on the names of the mechanics who did the bearing work".

Bearing work is hard work. Since last fall his crew has been working six days a week for a 60-hour week. It's also tiring work. The gears and bearings weigh up to 30 pounds each, and there is constant standing and lifting to be done.

Torres rotates his shop personnel frequently so they can become familiar with the individual bearing characteristics and end-item applications. The bearings, gears, and clutches are inducted and precision-cleaned, buffed and polished, and NDT'd before undergoing a detailed visual examination. Those that pass the visual exam are then processed thru a Class 100 Clean room (in which workers wear white suits and head covers) where they undergo a detailed dimensional inspection to blue-print specification; and then lubricated, preserved, and packaged for delivery to the customer.

In all the years that Torres has been there "We have never had a crash traced to one of our bearings," he said proudly. "The AIB (accident investigation branch) folks come see us a lot when a crash occurs, just in case." ♦

—Ralph Yoder, Public Affairs Office, Corpus Christi Army Depot, CC, TX 78419 (361) 961 3627, [Ryoder@ccad.army.mil](mailto:Ryoder@ccad.army.mil)

## Emergency procedure training

Recent evaluations by the Directorate of Evaluation and Standardization have revealed some confusion concerning the interpretation of AR95-1, paragraph 4-8, Emergency Procedures Training, and the requirements of 4-8, b (2) as it relates to multi-engine helicopters. Paragraph 4-8, b(1) applied to single-engine helicopter touchdown emergency procedures, and does NOT apply to multi-engine helicopters.

Paragraph 4-8, b (1) states: *"hydraulics-off, auto-rotations (except from a hover) and anti-torque touchdown emergency procedures*

*training in single engine helicopters..."*

The rationale for this interpretation is based upon the following:

**a.** Multi-engine helicopters cannot be operated with the flight control hydraulics disabled.

**b.** Practice touchdown auto-rotations are prohibited in Army multi-engine helicopters.

**c.** There are no Aircrew Training Manual procedures for loss of directional control in Army multi-engine helicopters.

**d.** Roll-on landings are normal operating procedures and AR 95-1 does not require air-to-ground

communications or crash and rescue equipment on site to practice them.

As always, local commanders may establish more restrictive training requirements if they feel they are necessary. However, don't let paragraph 4-8 of AR 95-1 restrict you from conducting realistic training in Army multi-engine helicopters.

—STACOM 173, COL Richard M. Johnson, Director of Evaluation and Standardization, Fort Rucker, AL; DSN 558-9029, (334) 255-9029, [cameronc@rucker.army.mil](mailto:cameronc@rucker.army.mil)

Standardization Communication Prepared by the Division of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208, DSN 558-2603/2442. Information published in STACOM may precede formal staffing and distribution of Department of the Army official policy. Information is provided to commanders to enhance aviation operations and training support.

## Unauthorized oil substitution

Be alert for possible unauthorized substitution of hydraulic oil Mil-H-46170b in the place of Mil-H-83282 for aviation applications. There has been a reported incident of an aviation unit receiving hydraulic oil Mil-H-46170b (NSN 9150-01-131-3323) in the place of Mil-H-83282. The reported case involved personnel accidentally pulling the wrong oil from the storage facility. Hydraulic oil Mil-H-46170b has not been approved for use in Army aircraft or Army aviation support equipment.

DLA (the Defense Logistics Activity) is award that substitution is not authorized. Aviation units should inform their local supply source that Mil-H-46170b hydraulic oil should

not be issued to aviation units in place of Mil-H-83282.

Container of Mil-H-46170b are clearly marked **NOT TO BE USED FOR AIR APPLICATION**. This includes all army aircraft and aviation support equipment.

If an aircraft or piece of aviation support equipment has been serviced with Mil-H-46170b, maintenance personnel should flush and re-service the aircraft or equipment with the proper hydraulic oil prior to operation.

Current NSNs for Mil-H-83282 are:

**9150-00-149-7431 – 1 quart**

**9150-00-149-7432 – 1 gallon**

**9150-00-009-7709 – 10 gallon**

—the Black Hawk newsletter

## The tie-down and mooring story

**W**hen a big wind brews, make sure your birds are safely anchored to the ground and won't fly away on their own.

Typical blade tie-down instructions and aircraft mooring procedures for your aircraft are in its -23 TM.

But you should also check out TM 1-1520-250-23, *Aviation Unit and Aviation Intermediate Maintenance for General Tie-Down and Mooring on all Series Army Models AH-64, UH-60, CH-47, UH-1, AH-1, and OH-58 Helicopters*. It's the bible for aircraft tie-down and mooring info. It was written after a major windstorm devastated Fort Hood in 1989, and gives procedures and hardware to keep birds anchored in heavy winds.

This information is also being added to individual aircraft pubs as they are updated. If there are conflicts between an aircraft's pub and the tie-down manual, the tie-down TM takes precedence.

For more info on tie-down or mooring for your aircraft, contact Lee Bumbicka at the Aviation and Missile Command, DSN 897-4925, (256) 313-4925, [lee.bumbicka@redstone.army.mil](mailto:lee.bumbicka@redstone.army.mil) ♦

—PS Magazine

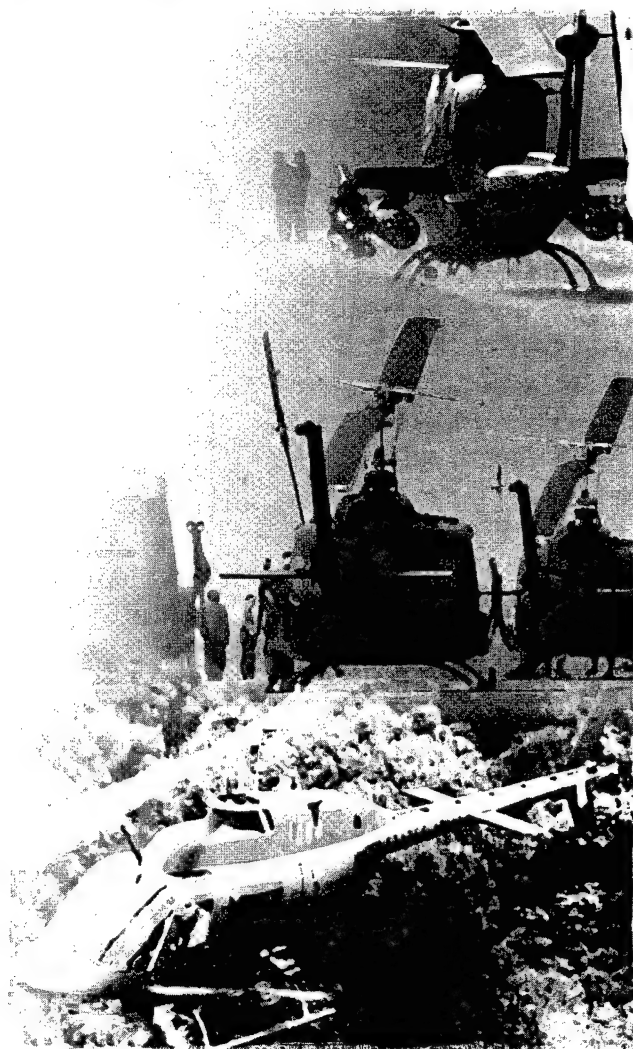
## Retirement looms for older systems

**T**hree types of Army helicopters will be retired in the next four years, and aviation battalions will be reorganized as part of the Army's 2000 Aviation Task Force. AH-1 Cobras will be divested by October 2001, said BG Craig Hackett, director of requirements in the Office of the Assistant Deputy Chief of Staff for Operations and Plans—Force Development. UH-1 Iroquois and A and C model OH-58 Kiowas will be retired by 2004.

According to the plan, the UH-1s will be replaced by UH-60 Black Hawks. The Cobras and Kiowas will be replaced by AH-64D Apaches and eventually by RAH-66 Comanches, the new reconnaissance and attack helicopter scheduled to begin joining the Army in 2008. Later-model Kiowas are scheduled for retirement in fiscal year 2013, according to the plan.

The modernization plan also affects the model D and F CH-47 Chinook cargo helicopters. The CH-47 Ds will be modified to become CH-47Fs, and existing F models will be upgraded with digital technology, Army officials said.

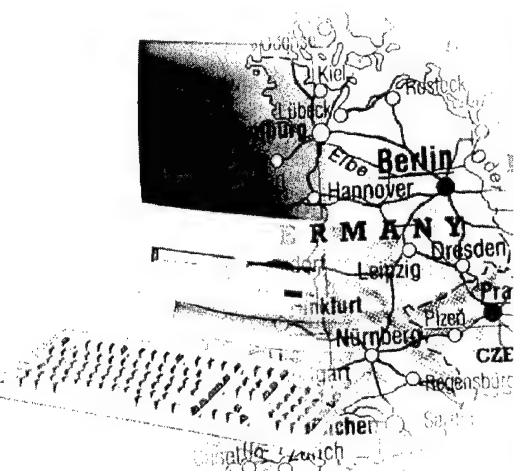
—Army News Service



# BASEOPS, the future is now!

In today's world, the aviation industry, Federal Aviation Administration, and other assorted businesses are embracing the so-called technological wave. They are using the web to do business.

One has to question, why US Army airfields around the



world are not following the lead or example of businesses around the world? Also, why are some airfield operations (BASEOPS) still so dead set on continuing to produce a blizzard of paper? I cannot answer these questions for other military airfields, but I can tell you what we do at Ansbach AHP BASEOPS in Germany.

The US Army pilot (fixed or rotary wing) has to cope with a myriad of tasks prior to his flight: weather briefs, NOTAMS, wire hazards updates, filing flight plans and pre-flight. The list goes on and on. There are several ways to "skin the cat"—faxing, telephone briefs, and so on.

But Ansbach AHP BASEOPS has taken a technological step forward to going "paperless" in flight planning and filing.

It's the first US Army airfield/heliport to fully embrace the Internet/Intranet technologies and e-mail to better serve our customers, the Army's aviators.

At Ansbach AHP, we are using e-mail and a website to furnish the pilots with access to, NOTAMS, weather briefs, weather satellite pictures, Army Aviation regulations, FAA regulations, helicopter safety and standards information, Local Flying Standard Operating Procedures for virtually all airfields in Germany and much, much more. A pilot can get all this and file his flight plan to Ansbach BASEOPS from a personal computer or Macintosh at home or work.

Why does Ansbach AHP BASEOPS do this? Call it common sense! It saves pilots and unit operations personnel time from walking (or driving) up and down flight lines bringing flight plans or picking up flight information. It places all the information at the pilot's fingertips. It also brings BASEOPS in line with the Secretary of Defense's policy on offices going "paperless" and getting a head start on the Federal Act of 2003 that requires all government offices where possible to reduce the paperwork.

Since the website's inception in May 1999, the website has been "hit" or accessed 6,600 times! Also, we started

accepting flight plans during January 2000 after receiving test approval from US Army Aeronautical Detachment Europe, V Corps Aviation and Standardization and Army Flight Operations Detachment.

It started slowly, with approximately 40 electronic flight plans filed during January. In June 2000 we received over 130 electronic flight plans. The number of flight plans we have received is amazing. Why? Because, most of the Ansbach AHP's aviation assets were deployed to Kosovo during KFOR operations. As of July 2000 (and the return of our flying assets), we have had a significant jump in website hits and electronic filings. During January our electronic flight plans filings only consisted of 10% of our flight plans received. By June it was up to 60-70% of flight plans received.

With little investment, using off the shelf technology, we are now doing Army aviation "business" at the speed of light! We have and are continuing to provide our pilots with the best service possible and plan to continue.

Why aren't other US Army airfields around the world attempting to save pilots time, money and The Black Forest in paper usage? I don't know. But I can say, come to Ansbach AHP, Germany, **and we will show you the future of Army airfield operations. Now!** ♦

—Bill "Big Jake" Jacobs  
Air Traffic Asst (Ansbach, Germany) web designer, webmaster for a US Army airfield's first web based flight-planning system,  
jacobsb@cmtymail.98asg.army.mil  
DSN 467-2872/2047



# Fire safety begins in your office

**W**hen I was a unit safety representative for a logistics support squadron, my duties were largely administrative. When I performed inspections in offices, I was often told, "You won't find much in here; all we do is office work."

Most of the time I found very little, but if I did find something, it was usually a fire hazard. Some of the hazards most often identified in office environments include, but are not limited to, the following. They should be fixed promptly.

**Power strips plugged into power strips.** With the increase in number of desktop computers in our work areas, some older buildings experience an acute shortage of available power outlets. This provides only a temporary solution. It becomes a hazard when one power strip is plugged into another. By doing so, the user is drawing power for two strips through a cord that is only rated for one.

**Extension cords used in lieu of permanent wiring.** Another short-term solution for limited outlets is the use of extension cords. Extension cords are ideal for short-term use. Extension cords can become a hazard when they are used for long periods of time. An extension cord used to power your personal computer is not an appropriate use. Often, extension cords are required to pull greater loads, and for longer

periods of time, than they were required to handle. In addition to this, they are often used across existing walkways where they can become frayed.

**The wrong type or inadequate numbers of fire extinguishers.** A work center may have been originally equipped with class A extinguisher, (for trash, paper, and wood combustibles) which was adequate for the work performed. With the addition of multiple desktop computers, a class ABC extinguisher is required.

Something else to consider is the number of extinguishers. Are there enough in the building to provide quick and easy access in the event of a fire? Do you know where they are?

**Materials stacked too close to light fixtures or fire detection suppression devices.** Offices are often in short supply of storage space. Work materials can end up on top of refrigerators, filing cabinets and shelves. Make sure these items are at least 18 inches away from overhead lights or fire detection/suppression devices.

Most of us would readily admit that refueling aircraft is an obviously dangerous operation with easily identifiable fire hazards. In contrast, very few of us would acknowledge that an office environment can and often does present some significant, though often overlooked, fire hazards. It's better to find them now than to have the fire chief explain them to you amidst the smoldering ruins of your workstation. ♦



## Download firefighting manuals

**T**ri-Max fire suppression systems recently completed an update of the operations, training, and maintenance manual and training video for the Tri-Max 3 and Tri-Max 30 fire suppression systems. The manuals can also be downloaded from the Tri-Max website [www.trimaxkoldcaf.com](http://www.trimaxkoldcaf.com)

Changes, along with maintenance advisories, will be posted on the website. The Tri-Max website also has a comment page to submit recommended changes to the manuals and other appropriate comments on Tri-Max products. Any organization that did not receive the new manual or video can request a copy by providing a POC and mailing address via e-mail to the Military Marketing Manager, COL (retired) Mike Smith, E-Mail: [smithmasa@aol.com](mailto:smithmasa@aol.com). ♦

# Rank in the cockpit – NCO Corner

Through the course of my career, I have met some top-notch individuals, pilots and enlisted crewmembers. As a flight engineer riding in the back of helicopters, I literally put my life in the hands of the pilots on the controls.

Back in the late 1980's and early 1990's, the US military realized that human error accidents, left unchecked, would consume irreplaceable lives and valuable airframes. Hence, the *Aircrew Coordination program* was instituted throughout Army aviation.

One of the goals of the program was to take junior crewmembers/aviators who were timid or shy, and teach them how to interact as a team during all stages of a mission. The other part of the goal was to take senior pilots or ranking individuals, and teach them how to receive input and assistance from all members of the crew without undermining authority or creating an atmosphere of hard feelings. Terms like "direct assistance" and the "two challenge rule" were introduced. These concepts apply to **all** members of a crew. Thorough briefings before and after a flight are essential to positive crew performance and successful missions.

Many times after a mission has been completed, I've been approached by crewmembers who reported that they were unhappy with how the mission

went. Sometimes they were unhappy enough to request they not be scheduled with that particular aviator again. When I ask them if they expressed their concerns during the debriefing, the answer is invariably "no". The reasons usually are expressed as "Well, he outranks me" or "he has more experience than me" or "he is just an overbearing individual, I just can't get a word in without getting verbally beat up."

There have been times during my flight experiences when I asked an aviator to stop doing something I didn't like, and rank had nothing to do with it. **My life had everything to do with it.** Some of these experiences include missed radio calls from ATC, flying unsafe maneuvers, and paradrop operations in a high-density air traffic environment.

After some of these flights, I've had pilots come to me and say they were glad that I let them know when I was uncomfortable with what was going on during a flight. There were no reprisals or badgering, just a handshake and a thank-you. They may not remember, but I do.

## PASS IT ON

I try to remember to continue to pass my knowledge on when teaching new

crewmembers aircrew coordination. We need to do a better job teaching junior aviators and crewmembers to speak their minds freely in the aircraft.

From some things I've seen recently, I'm not so sure we are doing a good job teaching that.

It may be that some don't know when they should speak up.

In my office, I have a case study of a B-52 accident. The pilot in command was the Wing Standardization Instructor Pilot. He had a three-year

history of performing unauthorized maneuvers in aircraft. Leadership at all levels, including the flight surgeon, had failed to take corrective action. The results were tragic.

At our facility, we have a wide variety of safety magazines from other branches of the service, as well as the Army's *Flightfax*. When I read about accidents involving very experienced crewmembers, I wonder why. How could things have gotten so bad that a mishap like that occurred? We must be vigilant. Treating each crewmember with respect and valuing their opinions are elements of a successful flight. Taking appropriate direction from the PC is also essential for a safe flight. ♦

—SFC Steven Robertson, CH-47  
Standardization Flight Engineer and Platoon  
Sergeant, Co H, 140<sup>th</sup> Aviation Regiment,  
California Army National Guard, DSN  
466-5322, Steven.Robertson@  
ca-armg.ngb.army.mil

**We need to do  
a better job  
teaching junior  
aviators and  
crewmembers  
to speak their  
minds freely in  
the aircraft.**

# Accident briefs

Information based on preliminary reports of aircraft accidents

## AH1



### Class C

#### F series

■ During performance of shallow approach, aircraft experienced engine trouble and made a hard forced landing. After landing, crew extinguished small engine area fire. Landing damage to skids and lower fuselage, with some fire damage to engine area components.

## AH64



### Class A

#### A series

■ Aircraft impacted the ground during aerial gunnery training. Postcrash fire ensued. Two fatalities.

### Class C

#### A series

■ During cruise flight, PNVs shroud came off and struck the elevator mirror. Aircraft landed without further incident.

### Class E

#### D series

■ During contour flight, No. 2 generator failed. Aircraft landed without further incident. Generator control unit was replaced.

## C12



### Class C

#### H series

■ Aircraft struck by lightning as it entered a thin layer of clouds. (Nearest reported thunderstorm was 50NM to the north). Aircraft landed without further incident. Damage was found to No.2 propeller and elevator.

## CH47



### Class C

#### D series

■ Slingload separated as aircraft was on final approach for drop off. Load

consisted of two M-998 HMMWVs. A loud report (clunking sound) and illumination of master caution and hook-caution lights at 50 feet AGL alerted the crew, who confirmed separation and landed the aircraft without further incident. Both vehicles sustained significant damage.

### Class E

#### D series

■ While on climbout during a limited test flight for main rotor tracking, the No.2 engine fire light illuminated. The crew executed a precautionary landing, with crash rescue responding. There was no fire. The cause is believed to be due to a faulty indication within the fire warning system.

#### D series

During search and rescue operation, aircraft landed on extremely rocky area with many very sharp rocks. Crew cleared area under ramp prior to lowering, but did not see rock due to blowing snow. Rock punctured small hole in ramp when it was lowered.

## OH58



### Class C

#### C series

■ During simulated auto with turn that was going to overshoot the landing area, IP attempted to terminate maneuver with power. N1 and N2 did not respond and aircraft bounced, then landed hard. Damage to vertical fin, both cross tubes and lower fuselage.

#### D (I) series

■ Aircraft was making final turn for landing when birdstrike occurred. Horizontal stabilizer was damaged.

■ Engine NP reading climbed to 122% when the Engine Supervisory Control (ESC) was disengaged while engine RPM was at 100%. Aircraft had been undergoing maintenance following an inflight "32" failure code on the ESC. Engine replacement required.

■ A range building was inadvertently destroyed by a Hellfire missile during gunnery training. Building was used

to house a rail-mounted moving target. No injuries were incurred.

### Class E

#### C series

■ Aircraft's fuel boost pump light illuminated while on the ground, engines running. Aircraft was shutdown without further incident. Replaced fuel boost pump cartridge.

## UH1



### Class E

#### H series

■ Hydraulic caution light illuminated while aircraft was at OGE hover. Pilot performed a precautionary landing without further incident. Maintenance determined that the hydraulic pressure switch had failed.

## UH60



### Class C

#### A series

■ During practice of tailwheel landings, tailwheel strut failed. Damage to tailwheel and possible tailboom damage.

### Class D

#### A series

■ Aircraft was found with the co-pilot's cockpit door missing. It is suspected that when an adjacent aircraft took off, the rotorwash caused the door to fly open and thereby be torn from the aircraft.

### Class E

#### A series

■ On post flight, PC found red tail rotor tip cap damage, a few scratches, and some chlorophyll on the tail boom. Tree strike suspected. Maintenance inspections revealed damage to the yellow tail rotor paddle tip cap and the lower anti-collision light support panel. Both the tip cap and support panel were replaced and the aircraft was released from maintenance.

For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

# GSE conference at Fort Rucker

The Directorate of Combat Developments-Aviation, Materiel and Logistics Systems Division at Fort Rucker, AL will host the 2nd Annual Aviation Ground Support Equipment (AGSE) Users Conference on 5 and 6 December 2000 at Ft. Rucker, AL., Officer's Club, Building 113, Novosel Street.

The theme for this year's conference is "Focus on the

Future." Equipment in the development process will be on display. The proposed aviation logistics vision and supporting AGSE will be reviewed and priorities set for future development and acquisition of Army AGSE. Attendance is intended for Brigade, Battalion and Company-level Maintenance Officers and NCOs. These personnel provide valuable input from the user's perspective on AGSE requirements and priorities. This input is extremely important in accomplishing our mission as

the user's representative. User participation gives the field commander the opportunity to provide input to future systems requirements.

Attendees wishing to depart with an electronic copy of the presentations are encouraged to bring one CD-R compact disc. Fort Rucker billeting reservations can be made by calling (334) 255-2626 or DSN 558-2626. Attendees are requested to RSVP NLT 10 November 2000. ♦

—CPT Rob Wegner, DSN 558-1580 or (334) 255-1580, fax ext-9191, email: [WegnerR@rucker.army.mil](mailto:WegnerR@rucker.army.mil).

# No in-flight meals, please

Don't allow anyone on an aircraft to use flameless ration heaters (FRH) to prepare MREs (Meals Ready to Eat) during flight. An activated FRH produces a vapor that contains hydrogen, a flammable gas. Air Force Joint Manual 24-204, para 3.6.3, prohibits the handling, opening, and use of FRF inside an aircraft. The Army equivalent regulation is TM 38-250. This restriction applies on any mission, including contract passenger aircraft. ♦

—Del Hamilton, HQ Air Mobility Command (USAF), DSN 576-3967 (618) 256-3967, [Delbert.Hamilton@scott.af.mil](mailto:Delbert.Hamilton@scott.af.mil)

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## POV Fatalities



through 31 August

FY00  
100

FY99  
115

3-yr Avg  
101



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*Gene M. LaCoste*

Gene M. LaCoste  
Brigadier General, USA  
Commanding